

# Formtracer Extreme SV-C3000CNC / SV-C4000CNC

SERIES 525 — Surface Roughness/Form Measuring Instrument



SV-3000CNC with personal computer system and software



Surface roughness drive unit



Contour drive unit



## FEATURES

- High-accuracy CNC Surface Roughness/Form Measuring Instrument that allows both measurement of surface roughness and form/contour with one unit.
- Each axes has the maximum drive speed of 200mm/s, which permits high-speed positioning that may result in a large increase in the throughput of multiple-profile/multiple-workpiece measurement tasks.
- For models with the  $\alpha$  axis, it is possible to perform continuous measurement over horizontal and inclined surfaces by power-tilting the detector unit.
- For models with the Y-axis table, it is possible to expand the measuring range for multiple workpieces, etc., through positioning in the Y-axis direction.
- The contour drive unit of SV-C4000CNC series is equipped with a Laser Hologage detector giving excellent narrow/wide range accuracy and resolution in the Z1-axis.
- Enables inclined plane measurements through 2 axes simultaneous control in the X- and Y-axis directions.
- When the detector for form/contour measurement is replaced with that for surface roughness measurement, or vice versa, it is a simple, one-touch replacement without re-routing of the connecting cables.
- Since the Z1-axis detector incorporates an anti-collision safety device, the detector unit will automatically stop even if its main body collides with a workpiece or jig
- Supplied with an easy-to-operate Remote Box, on which the user can make any movement by selecting the required axis using the two joysticks. The current axis selection is easily identified by the icon on the key top.
- Communication with the Data Processing/Analysis section is via USB.

## Technical Data: Common

Base size (W x H):	750 x 600mm
Base material:	Granite
Mass:	240kg, 250kg (high column type)
Power supply:	100 - 240VAC $\pm$ 10%, 50/60Hz
Power consumption:	500W (main unit only)

## Technical Data: Contour Measurement

X1-axis	
Measuring range:	200mm
Resolution:	0.05 $\mu$ m
Measurement method:	Reflective-type linear encoder
Drive speed:	200mm/s (max., CNC) 0 - 60mm/s (joystick)
Measuring speed:	0.02 - 2mm/s
Measuring direction:	Forward/backward
Traverse linearity:	2 $\mu$ m/200mm *with the X axis in horizontal orientation
Linear displacement accuracy (at 20°C):	$\pm$ (1+0.02L) $\mu$ m, * L = Drive length (mm)
$\alpha$ -axis	
Inclination angle:	-45° to +10°
Resolution:	0.000225°
Rotating speed:	1rpm
Z2-axis (column)	
Vertical travel:	300mm or 500mm
Resolution:	0.05 $\mu$ m
Measurement method:	Reflective-type linear encoder
Drive speed:	200mm/s (max., CNC) 0 - 60mm/s (joystick)
Z1-axis (detector unit)	
Measuring range:	$\pm$ 25mm
Resolution:	0.2 $\mu$ m (SV-C3100CNC), 0.05 $\mu$ m (SV-C4100CNC)
Measurement method:	Linear encoder (SV-C3100CNC), laser hologage (SV-C4100CNC)
Linear displacement accuracy (at 20°C):	$\pm$ (3+12HI/25) $\mu$ m (SV-C3100CNC) $\pm$ (0.8+0.5HI/25) $\mu$ m (SV-C4100CNC) *H: Measurement height from the horizontal position (mm)

Stylus up/down operation:	Arc movement
Face of stylus:	Downward
Measuring force:	30mN
Traceable angle:	Ascent: 70°, descent: 70° (using the standard stylus provided and depending on the surface roughness)
Stylus tip:	Radius: 25 $\mu$ m, carbide tip

## Technical Data: Surface Roughness Measurement

X1-axis	
Measuring range:	200mm
Resolution:	0.05 $\mu$ m
Measurement method:	Reflective-type linear encoder
Drive speed:	200mm/s (max., CNC) 0 - 60mm/s (joystick)
Measuring speed:	0.02 - 2mm/s
Traverse direction:	Backward
Traverse linearity:	0.5 $\mu$ m / 200mm
$\alpha$ -axis	
Inclination angle:	-45° to +10°
Resolution:	0.000225°
Rotating speed:	1rpm
Z2-axis (column)	
Vertical travel:	300mm or 500mm
Resolution:	0.05 $\mu$ m
Measurement method:	Reflective-type linear encoder
Drive speed:	200mm/s (max., CNC) 0 - 60mm/s (joystick)
Detector (optional)	
Range / resolution:	800 $\mu$ m / 0.01 $\mu$ m, 80 $\mu$ m / 0.001 $\mu$ m, 8 $\mu$ m / 0.0001 $\mu$ m (up to 2400 $\mu$ m with an optional stylus)
Detecting method:	Skidless / skid measurement
Measuring force:	4mN or 0.75mN (low force type)
Stylus tip:	Diamond, 90° / 5 $\mu$ mR (60° / 2 $\mu$ mR: low force type)
Skid radius of curvature:	40mm
Detecting method:	Differential inductance

### Main Unit Startup System

This machine incorporates a startup system (relocation detection system), which disables operation when an unexpected vibration is applied or the machine is relocated. Be sure to contact your nearest Mitutoyo prior to relocating this machine after initial installation. Refer to the page 9 for details.

## Optional Accessory

Vibration insulating stand

Vibration insulating mechanism: Diaphragm air spring

Natural frequency : 2.5 - 3.5Hz

Damping mechanism: Orifice

Leveling mechanism: Automatic control with mechanical valves

Air supply pressure: 0.4Mpa

Allowable loading capacity: 350kg

Dimensions (W x D x H): 1000 x 895 x 715mm

Mass: 280kg

Y-axis table unit

Measuring range: 200mm

Minimum reading : 0.05 $\mu$ m

Scale unit: Reflective-type Linear Encoder

Drive speed: 200mm/s (max., CNC)

0 - 60mm/s (joystick)

Maximum loading capacity: 20 kg

Traverse linearity 0.5 $\mu$ m / 200mm

Linear displacement accuracy (at 20°C):

$\pm$  (2+2L/100) $\mu$ m, contour mode

L: Dimension between two measured

points (mm)

Table size: 200 x 200mm

Dimensions (W x D x H): 320 x 646 x 105mm

Mass: 35kg

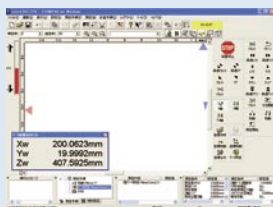


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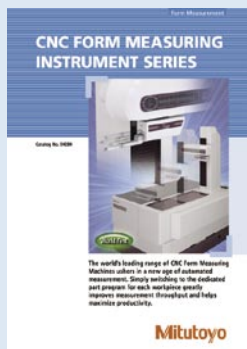
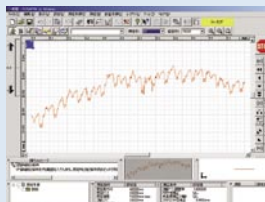
## Optional Software FORMTRACEPAK

Enables control of the optional motor-driven Y-axis table and rotary table for realizing efficient measurement automation. You can also perform contour evaluation that allows free analysis of level differences, angle, pitch, area and other characteristics based on surface roughness data. In addition, you can create an original inspection certificate by setting the print format to suit your particular requirements.



Contour Measurement Screen

Surface Roughness Measurement Screen



Refer to the CNC Form Measuring Instrument Series leaflet (E4284) for more details.

## SPECIFICATIONS

Model No.	SV-C3000CNC	SV-C3000CNC	SV-C3000CNC	SV-C3000CNC
<b>Order No. (100V - 120V)</b>	<b>525-521-1</b>	<b>525-522-1</b>	<b>525-523-1</b>	<b>525-524-1</b>
<b>Order No. (200V - 240V)</b>	<b>525-521-2</b>	<b>525-522-2</b>	<b>525-523-2</b>	<b>525-524-2</b>
X1-axis measuring range	200mm	200mm	200mm	200mm
Z2-axis vertical travel	300mm	300mm	300mm	300mm
Y-axis table unit	—	—	Installed	Installed
$\alpha$ -axis unit	—	Installed	—	Installed
Granite base size (WxD)	750 x 600mm	750 x 600mm	750 x 600mm	750 x 600mm
Dimensions (main unit, WxDxH)	800 x 620 x 1000mm	800 x 620 x 1000mm	800 x 620 x 1000mm	800 x 620 x 1000mm
Mass (main unit)	240kg	240kg	240kg	240kg

Model No.	SV-C3000CNC	SV-C3000CNC	SV-C3000CNC	SV-C3000CNC
<b>Order No. (100V - 120V)</b>	<b>525-541-1</b>	<b>525-542-1</b>	<b>525-543-1</b>	<b>525-544-1</b>
<b>Order No. (200V - 240V)</b>	<b>525-541-2</b>	<b>525-542-2</b>	<b>525-543-2</b>	<b>525-544-2</b>
X1-axis measuring range	200mm	200mm	200mm	200mm
Z2-axis vertical travel	500mm	500mm	500mm	500mm
Y-axis table unit	—	—	Installed	Installed
$\alpha$ -axis unit	—	Installed	—	Installed
Granite base size (WxD)	750 x 600mm	750 x 600mm	750 x 600mm	750 x 600mm
Dimensions (main unit, WxDxH)	800 x 620 x 1200mm	800 x 620 x 1200mm	800 x 620 x 1200mm	800 x 620 x 1200mm
Mass (main unit)	250kg	250kg	250kg	250kg

Model No.	SV-C4000CNC	SV-C4000CNC	SV-C4000CNC	SV-C4000CNC
<b>Order No. (100V - 120V)</b>	<b>525-621-1</b>	<b>525-622-1</b>	<b>525-623-1</b>	<b>525-624-1</b>
<b>Order No. (200V - 240V)</b>	<b>525-621-2</b>	<b>525-622-2</b>	<b>525-623-2</b>	<b>525-624-2</b>
X1-axis measuring range	200mm	200mm	200mm	200mm
Z2-axis vertical travel	300mm	300mm	300mm	300mm
Y-axis table unit	—	—	Installed	Installed
$\alpha$ -axis unit	—	Installed	—	Installed
Granite base size (WxD)	750 x 600mm	750 x 600mm	750 x 600mm	750 x 600mm
Dimensions (main unit, WxDxH)	800 x 620 x 1000mm	800 x 620 x 1000mm	800 x 620 x 1000mm	800 x 620 x 1000mm
Mass (main unit)	240kg	240kg	240kg	240kg

Model No.	SV-C4000CNC	SV-C4000CNC	SV-C4000CNC	SV-C4000CNC
<b>Order No. (100V - 120V)</b>	<b>525-641-1</b>	<b>525-642-1</b>	<b>525-643-1</b>	<b>525-644-1</b>
<b>Order No. (200V - 240V)</b>	<b>525-641-2</b>	<b>525-642-2</b>	<b>525-643-2</b>	<b>525-644-2</b>
X1-axis measuring range	200mm	200mm	200mm	200mm
Z2-axis vertical travel	500mm	500mm	500mm	500mm
Y-axis table unit	—	—	Installed	Installed
$\alpha$ -axis unit	—	Installed	—	Installed
Granite base size (WxD)	750 x 600mm	750 x 600mm	750 x 600mm	750 x 600mm
Dimensions (main unit, WxDxH)	800 x 620 x 1200mm	800 x 620 x 1200mm	800 x 620 x 1200mm	800 x 620 x 1200mm
Mass (main unit)	250kg	250kg	250kg	250kg

